

WHAT IS CLAIMED IS:

1 1. A process of cleaning a precision surface comprising contacting an etched
2 precision surface having vias, cavities, trenches or channels incorporated therein with a
3 composition which comprises liquid or supercritical carbon dioxide and a fluoride-generating
4 species.

1 2. A process in accordance with Claim 1 wherein said fluoride-generating source is a
2 fluorine-containing acid.

1 3. A process in accordance with Claim 1 wherein said fluorine-containing acid is
2 selected from the group consisting of hydrogen fluoride, fluorosulfonic acid and
3 perfluorosulfonic acid.

1 4. A process in accordance with Claim 1 wherein said fluoride-generating species is
2 a fluorine-containing acid amine adduct.

1 5. A process in accordance with Claim 4 wherein said fluorine-containing amine
2 adduct is pyridine:hydrogen fluoride, amine:hydrogen fluoride or an alkylamine:hydrogen
3 fluoride.

1 6. A process in accordance with Claim 1 wherein said fluoride-generating species is
2 an amine fluoride.

1 7. A process in accordance with Claim 1 wherein said fluoride-generating species is
2 a quaternary amine fluoride.

1 8. A process in accordance with Claim 7 wherein said quaternary amine fluoride is
2 selected from the group consisting of a tetraalkylammonium fluoride and a
3 perfluoroalkylammonium fluoride.

1 9. A process in accordance with Claim 1 wherein said fluoride-generating species is
2 a perfluororalkylsulfonyl fluoride.

1 10. A process in accordance with Claim 9 wherein said perfluororalkylsulfonyl
2 fluoride is trifluoromethylsulfonyl fluoride or perfluorooctylsulfonyl fluoride.

1 11. A process in accordance with Claim 1 wherein said fluoride-generating species is
2 an alkylsulfonyl fluoride.

1 12. A process in accordance with Claim 1 wherein said fluoride-generating source is
2 an arylsulfonyl fluoride.

1 13. A process in accordance with Claim 1 wherein said fluoride-generating source is
2 an onium salt-containing fluorine.

1 14. A process in accordance with Claim 13 wherein said onium salt containing
2 fluorine is selected from the group consisting of benzene diazonium fluoride and benzene
3 diazonium tetrafluoroborate.

1 15. A process in accordance with Claim 1 wherein said composition includes a
2 component selected from the group consisting of surfactant, a co-solvent and mixtures
3 thereof.

1 16. A process in accordance with Claim 1 wherein said contact between said
2 precision surface and said composition occurs at a pressure in the range of between about
3 1,000 psi and about 6,000 psi and at a temperature in the range of between about 40°C and
4 about 100°C.

1 17. A process in accordance with Claim 1 wherein said precision surface is provided
2 by a semiconductor sample, a metal selected from the group consisting of aluminum, silicon,
3 tungsten, titanium, tantalum, platinum, palladium, iridium, chromium, copper and silver, a
4 polymer selected from the group consisting of polyimides and polyamides or insulators.

1 18. A process in accordance with Claim 17 wherein said precision surface is
2 provided by a semiconductor sample.

1 19. A process in accordance with Claim 18 wherein said semiconductor sample is
2 selected from the group consisting of a semiconductor wafer, a semiconductor chip, a
3 ceramic substrate and a patterned film structure.

- 1 20. A process in accordance with Claim 19 wherein said semiconductor sample is a
2 semiconductor wafer.

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